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Application No.: 10/028,305
Art Unit: 2871Docket No.: 3449-0896PUS1
Reply to March 19, 2008 Office Action
Page 2 of 29**AMENDMENTS TO THE CLAIMS**

1. (Currently Amended) A liquid crystal display device produced by the process of claim 8, comprising:

a substrate;

a gate electrode over the substrate;

a first semiconductor layer over the gate electrode;

a second semiconductor layer over the first semiconductor layer defining a separation region with the first semiconductor layer;

a first metal layer on the second semiconductor layer to define a separation region, wherein the first metal layer is patterned in a same pattern as the second semiconductor layer such that an outer edge of the first metal layer and an outer edge of the second semiconductor layer are lined up with one another to define a separation region for exposing some surfaces of the first semiconductor layer; and

source and drain electrodes having a first portion overlapping with the first metal layer and the second semiconductor layer to define a first upper portion of the separation region that abuts the lined up outer edges of the first and second semiconductor layers, and a second portion overlapping with the substrate around the gate electrode, wherein the source and drain electrodes include a second and a third metal layer, and

a data pad over the substrate including the second and the third metal layers.

2. (Original) The device of claim 1, further comprising:

an insulating layer in between the gate electrode and the first semiconductor layer;

Application No.: 10/028,305
Art Unit: 2871

Docket No.: 3449-0896PUS1
Reply to March 19, 2008 Office Action
Page 3 of 29

a protective layer over the source and drain electrodes and defining a second upper portion of the separation region and a contact hole exposing a portion of the drain electrode; and a pixel electrode in the contact hole.

3. (Previously Presented) The device of claim 1, wherein the second metal layer includes aluminum or an aluminum alloy.

4. (Original) The device of claim 1, wherein the first and third metal layers are formed of the same material.

5. (Original) The device of claim 1, wherein the first and third metal layers are formed of different materials.

6. (Original) The device of claim 1, wherein the first and third metal layers include titanium, tungsten, tantalum, chromium or molybdenum.

7. (Original) The device of claim 4, wherein the first and third metal layers include titanium, tungsten, tantalum, chromium or molybdenum.

8. (Currently Amended) A method of forming a liquid crystal display device, comprising:

forming a gate electrode on a substrate;

Application No.: 10/028,305
Art Unit: 2871

Docket No.: 3449-0896PUS1
Reply to March 19, 2008 Office Action
Page 4 of 29

forming an active layer over the gate electrode;
forming a first semiconductor layer over the active layer;
forming a second semiconductor layer over the first semiconductor layer to define a separation region with the first semiconductor layer;
forming a first metal layer over the second semiconductor layer;
forming and patterning a source electrode and a drain electrode over the first metal layer and a data pad over the substrate using a wet-etch process, wherein the source electrode and the drain electrode include a second and a third metal layer; and
subsequently patterning the first metal layer and the second semiconductor layer in a same pattern by dry-etching using the previously formed and patterned source and drain electrodes as a mask to expose the active layer between the source and drain electrodes to create a defined outer edge of the first metal layer and a defined outer edge of the second semiconductor layer lined up with one another to define the separation region and to reduce over-etching of the first metal layer and thereby reduce a leakage current,
wherein the data pad over the substrate includes the second and the third metal layers.

9. (Original) The method of claim 8, wherein forming the source and drain electrodes includes

forming a second metal layer over the first metal layer,
forming a third metal layer over the first metal layer, and

Application No.: 10/028,305
Art Unit: 2871

Docket No.: 3449-0896PUS1
Reply to March 19, 2008 Office Action
Page 5 of 29

patterning the second and third metal layers in the same pattern as the first metal layer and second semiconductor layer in the channel region so that a channel portion of the first semiconductor layer is exposed.

10. (Original) The method of claim 8, wherein the first metal layer is formed of titanium, tungsten, tantalum, chromium or molybdenum.

11. (Original) The method of claim 9, wherein the first and third metal layers are formed of the same material.

12. (Original) The method of claim 9, wherein the first and third metal layers are formed of a different material.

13. (Original) The method of claim 9, wherein the second metal layer is formed of aluminum or an aluminum alloy.

14. (Original) The method of claim 9, wherein the first and third metal layers are formed of titanium, tungsten, tantalum, chromium or molybdenum.

Application No.: 10/028,305
Art Unit: 2871

Docket No.: 3449-0896PUS1
Reply to March 19, 2008 Office Action
Page 6 of 29

15. (Original) The method of claim 8, wherein

the patterning of the first metal layer and the second semiconductor layer to define a channel region includes removing a portion of the first metal layer and second metal layer corresponding to the gate electrode and exposing the first semiconductor layer.

16-20. (Canceled)

21. (Previously Presented) A method of forming a liquid crystal display device, comprising:

forming a gate electrode on a substrate;

forming an active layer over the gate electrode;

forming a first semiconductor layer over the active layer;

forming a second semiconductor layer over the first semiconductor layer to define a separation region with the first semiconductor layer;

forming a first metal layer over the second semiconductor layer to define a separation region;

forming and patterning a source electrode and a drain electrode over the first metal layer and a data pad over the substrate by a wet-etch process of limited duration that allows the source electrode and the drain electrode to be etched but does not allow over-etching of the first metal layer, wherein the source and drain electrodes include a second and a third metal layer;

forming an ohmic contact layer on the second semiconductor layer; and

Application No.: 10/028,305
Art Unit: 2871

Docket No.: 3449-0896PUS1
Reply to March 19, 2008 Office Action
Page 7 of 29

subsequently patterning, simultaneously, the first metal layer, the second semiconductor layer, and the ohmic contact layer in a same pattern by dry-etching using the previously formed and patterned source and drain electrodes as a mask to expose the active layer between the source and drain electrodes defined outer edge of the first metal layer and a defined outer edge of the semiconductor layer lined up with one another to define the separation region and to reduce over-etching of the first metal layer and thereby reduce a leakage current,

wherein a data pad over the substrate includes the second and third metal layers.

22. (Previously Presented) A liquid crystal display device produced by the process of claim 21.